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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,684	07/28/2003	Yasushi Isayama	2003_1051	4559

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EXAMINER	
WILKINS III, HARRY D	

ART UNIT	PAPER NUMBER
1742	

DATE MAILED: 03/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/627,684	ISAYAMA ET AL.	
	Examiner	Art Unit	
	Harry D. Wilkins, III	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *5-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/830,407.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status

1. The rejection grounds presented in the previous Office action have been withdrawn in view of Applicant canceling claims 1-2 and presenting new claims 5-10.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 5-7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh et al (US 6,113,769) in view of Andricacos et al (US 5,352,350).

Uzoh et al teach (see figure 1, abstract and col. 3, line 30 to col. 7, line 49) a method for managing components of a plating liquid in a plating apparatus having a plating liquid sampling device 31 for *sampling* the plating liquid, an automatic analyzing device 33 for automatically *analyzing* the components of the plating liquid sampled by the plating liquid sampling device and a component replenishing liquid supply device (CHEM A, CHEM B, CHEM C and PREMIX TANK) comprising the components of the plating liquid, wherein the component replenishing liquids were *supplied* to the plating liquid *based on analyzed results* from the automatic analyzing device. The component replenishing liquids were supplied by the component replenishing liquid supply device to the plating liquid for thereby individually replenishing and managing the components of the plating liquid.

Thus, Uzoh et al fail to teach that the replenishing liquids included, a standard liquid, a plurality of solutions of a basic liquid with additives, sulfuric acid and hydrochloric acid. Uzoh et al do teach mixing various chemicals (CHEM. A, CHEM. B and CHEM. C) in a pre-mix tank, and feeding the mixed solution into the plating tank reservoir. Uzoh et al teach (see col. 4, lines 26-41) monitoring various components including acid, organic addition agents, metal ions and chloride ions.

Andricacos et al teach (see figure 2 and related description) that various solutions were added to plating solutions in order to maintain the proper electrolyte chemistry. Such additions included a standard liquid (water) and a plurality of liquids each including the basic liquid (water) and an additive (iron, nickel, acid).

Therefore, it would have been obvious to one of ordinary skill in the art to have used a standard solution as taught by Andricacos et al and additional solutions each containing the basic liquid (acidic copper sulfate solution) and a single additive as the various chemicals taught by Uzoh et al to maintain the plating solution. Since the electroplating bath had a specific desired composition, it would have been obvious to one of ordinary skill in the art to have made the "standard liquid" to have the precise desired composition by including the acidic copper sulfate solution, all of the additives and hydrochloric acid (to provide the desired acidity and chloride ions).

Regarding claim 6, the method of Uzoh et al included (see col. 5, lines 3-16) draining liquid from the tank. It would have been obvious to one of ordinary skill in the art to have made the rate of draining equal to the rate of supplying the replenishing

liquids in order to have maintained the total volume of liquid at the same level throughout the process.

Regarding claim 7, Andricacos et al teach (see col. 6, lines 42-62) that certain components of an electroplating bath were consumed at a rate proportional to the amount of electroplating done, and suggest controlling those components based on the amount of electroplating done.

Regarding claim 9, it would have been obvious to one of ordinary skill in the art to have varied the frequency of sampling during the process to allow for time periods of precise control of the composition by a higher frequency of sampling.

Regarding claim 10, the replenishment of Uzoh et al was done such that the concentrations of the various components were maintained at desired levels.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh et al (US 6,113,769) in view of Andricacos et al (US 5,352,350) as applied to claim 5 above, and further in view of Smith (H36).

The teachings of Uzoh et al are described above.

Uzoh et al fail to teach controlling the replenishment of components based on the quantity of substrates plated.

Smith teaches (see col. 6, lines 3-14) that the amount of copper that needed to be replenished in a recycled electrolyte could be directly inferred from the total charge transferred in the electroplating cell because the total charge transferred was indicative of the amount of copper removed form the bath and electroplated onto the substrate.

Therefore, it would have been obvious to one of ordinary skill in the art to have further based the replenishment step on the total charge transferred (i.e.-electricity consumed) in the electroplating cell because Smith teaches that the amount of copper to be added to replenish the consumed copper could be calculated from the total charge used in the cell.

Response to Arguments

5. Applicant's arguments with respect to claims 5-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Harry D Wilkins, III
Examiner
Art Unit 1742

hdw